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ABSTRACT

Findings of the 1981-1982 and 1982-1983 Consortium on Financing Higher Education (COFHE) Graduate Project are summarized, with attention to application, admission, and enrollment data for representative departments across project institutions. This Nine Discipline Study (NDS) created a database for nine graduate fields representing the humanities, social sciences, natural sciences, and engineering. These fields are: French, English, philosophy, political science, economics, biochemistry, chemistry, mechanical/aeronautical engineering, and chemical engineering. Data were collected from more than 150 departments at 20 colleges, on all applicants for full-time graduate study, with emphasis on doctoral study. Findings include: in both years, more than 11,000 applicants submitted over 21,000 applications to departments; the average number of applicants submitted to a given department averaged from under two to almost five per applicant; there was a highly selective admissions process that favored higher ability applicants; in all disciplines there was a strong relationship between admission rates and tested ability; and the probability of an admitted applicant's matriculating increased if financial support was offered. Information for English departments is provided. (SW)

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Nine Disciplines 1981-82 and 1982-83:

A COFHE Graduate Project Study

Summary

Consortium on Financing Higher Education
October 1984

Graduate Project Institutions:

Brown University
Bryn Mawr College
Columbia University
Cornell University
Duke University
Harvard University
The Johns Hopkins University
Massachusetts Institute of Technology
Northwestern University
Princeton University
Smith College
Stanford University
University of California, Berkeley
The University of Chicago
University of Michigan, Ann Arbor
University of North Carolina, Chapel Hill
University of Pennsylvania
University of Rochester
Washington University
Yale University

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Introduction

Graduate education plays a key role in the intellectual, economic, and social health of the nation. The degree to which the graduate enterprise can fulfill this role effectively depends to a large extent on the health and vitality of graduate education itself, and its ability to convey its important messages to other public and private constituencies. Over the course of the last decade, all sectors of post-baccalaureate education have experienced major changes in application and enrollment patterns and significant shifts in the distribution and levels of financial support for research, facilities, and graduate students. With these shifts have come questions and concerns about the quality of graduate applicants to graduate and professional programs, the future supply of first-rate faculty, opportunity and access, and the financing of graduate studies.¹ To date, empirical evidence to address these concerns has been lacking; responses have been largely anecdotal and national policies related to graduate education.

Over the past four years, dating from a meeting in Chicago in 1980 at which representatives of several graduate schools met to discuss both the desirability and the feasibility of doing something more formal with respect to data collection, analysis, and recommendations for national policy for graduate education, the COFHE (Consortium on Financing Higher Education) Graduate Research Project has been engaged in a number of important activities. From the outset of the project, however, a major focus has been a systematic effort to collect and to analyze application, admission, and enrollment data for representative departments across project institutions -- what has come to be known as the Nine Discipline Study.

The results of the NDS were reported to the members of the COFHE Graduate Project in the late summer of 1984 in an extensive two-volume report. This publication is intended to provide an overview of the study and a summary of the principal findings to

academic administrators and interested faculty who do not need to tackle the larger report and for interested members of the graduate community outside the COFHE project group.

Acknowledgements

We would like to acknowledge here the generous support of the Andrew W. Mellon Foundation for the completion of this major undertaking in data analysis and for support in the dissemination of our work through this volume. The NDS is the product of the efforts of many: staff in the departments studied, staff in the graduate deans' offices and the members of the COFHE Graduate Project Advisory Group under the leadership of their chairperson, Karlene Dickey of Stanford University.² It is also the specific result of the intellectual collaboration of three people over a ten month period of data analysis and writing: Dr. Ann Porteus, Director of the COFHE Graduate Project, Dr. Larry Litten, Associate Director of COFHE and Assistant Provost Allen Sanderson of the University of Chicago.

Scope

In the Nine Discipline Study (NDS), we created and analyzed a data base for nine graduate fields representing the humanities, social sciences, natural sciences, and engineering -- French, English, philosophy, political science, economics, biochemistry, chemistry, mechanical/aeronautical engineering, and chemical engineering -- across twenty project institutions, a total of more than 150 departments. Data were collected on all people who applied for full-time graduate study to at least one COFHE project institution for the 1981-1982 and 1982-1983 academic years. Emphasis is on doctoral study throughout the report.

Caveats

This was clearly a pioneer effort. We reached around the country to major research universities to bring together institutional data in hopes of building an empirically based picture of graduate education never before attempted. That the twenty participating institutions were able to provide data at the level of detail demanded by the design of the study is evidence of a truly cooperative spirit within the graduate community and a portent of what is possible for other research efforts in the future. Yet, at almost every turn, caveats have been noted with the tables and the narrative.

Through the NDS project, we sought good information on (a) applicant, admission, and matriculant patterns, (b) the many dimensions of financial aid, and (c) the characteristics of applicants -- quality, gender, ethnicity and residency -- who compose the various pools. The financial aid and student quality data both proved to be exceedingly difficult to obtain and are therefore less complete and less reliable than the other data in the report.

In addition, we have only taken one snapshot in time. While we have collected two years worth of data, we have no way of understanding the inter-year anomalies that did arise, or determining if the observed differences between the two years are the result of real changes or are merely bi-products of our data collection methods. Overall we observed consistent application, admission, and matriculation patterns across the two years, but data collected at additional points in time are required to identify trends, to bring a better understanding and interpretation to the findings, and to advise in matters of policy.

Many of the preceding comments pertain to procedural matters, some of which could be modified and improved in any subsequent effort to collect data such as these. A subsequent effort should also strive to expand the data collection beyond the limited, albeit very important, set of institutions represented in the project. To determine the true overlap patterns or the size of national applicant pools would require the inclusion of many more departments. The "top twenty" -- however defined -- for each discipline plus other regional competitors would appear to be the minimum acceptable scope. And complementary research is needed on college graduates who chose not to pursue graduate study, selecting instead employment or one of the many professional degree alternatives.

Findings

Many of the important findings and conclusions of the Nine Discipline Study are institution-, department- or discipline-specific. The main value for many of the COFHE Graduate Project members will come from working their own way through the tabular data and appendices in the large two-volume report. The tables and appendices are rich in detail, and several analytic methods especially appropriate for these kinds of data have been demonstrated in that report. There are, however, some general

findings that cut across institutions and disciplines, feed into other studies, confirm (or respond to) conventional wisdom, surprise us, and help us to understand more fully and appreciate what we know -- and don't know -- about graduate education. Our principal findings are summarized below.

Application, Admission and Matriculation Patterns:

- o In both 1981-1982 and 1982-1983, more than 11,000 applicants submitted over 21,000 applications to Project departments (about two applications per applicant on average for doctoral applicants but just above one on average for masters' candidates).
- o The modal number of applications per applicant in each year was one for each of the nine disciplines, with about half of the applicants submitting only one application. There was a sizable incidence of multiple applications, however, and about three-fourths of the total number of applications came from those who submitted more than one application.
- o There was substantial variation in the number of applications submitted to a given department, with averages running from just under two to almost five per applicant.
- o There was considerable variation in the size of applicant pools across disciplines and institutions, though substantially less across institutions than across disciplines.
- o In the aggregate about one-half of the applicants were admitted to at least one Project department. The chances of being admitted to at least one doctoral program were highest among applicants who submitted relatively large numbers of applications; however, there appeared to be diminishing returns from each additional application submitted.
- o About one-half of the admitted applicants matriculated at a Project department, the rate for 1982-1983 being slightly higher than in 1981-1982. The matriculation rates were surprisingly uniform across disciplines but varied widely across departments within a discipline.
- o Overall in both years, out of all the doctoral applicants to Project institutions, only one-fourth enrolled for

graduate study within the Project, though there was considerable variation across disciplines.

Application and Admissions Overlap:

- o Generally, admission overlap was far less pronounced than application overlap. A relatively large proportion of applicants who were admitted to one Project department were not admitted to any other Project department, even among those who had submitted multiple applications.
- o Matriculation patterns showed that in general, a department's "losses" of admitted applicants were unconcentrated, with no single department capturing a large portion of a given institution's admit pool; admits elected to go to one of any number of Project departments and a sizable proportion of admits matriculated outside the Project (or, perhaps, did not enroll anywhere).
- o The overlap patterns suggest that the doctoral applicant pools were not necessarily homogeneous, that there was not a consensus on who the "best" applicants were, and that Project departments may be seen by admitted applicants as interchangeable.

Student Characteristics and Demographic Patterns:

- o The Project pool of doctoral applicants, admits, and matriculants were of substantially higher tested ability -- as measured by GRE test performance -- than the national pool of test takers.
- o There was a highly selective admissions process that favored higher ability applicants; in all disciplines there was a strong relationship between admit rates and tested ability. Self-selection -- matriculation decisions -- resulted in a similarly high ability matriculant pool.
- o While admissions decisions did not generally discriminate against women -- the admit rates were, with some exceptions, comparable for women and men -- Project data show that women were seriously underrepresented in engineering, and moderately underrepresented in the social and natural sciences.

- o There is cause for serious concern about minority representation in Project institutions in all nine disciplines. In both years there was an extremely low absolute and relative representation of minorities in the doctoral applicant pool in each discipline.
- c Minorities did not gain in the admission stage in any of the nine disciplines; Caucasians were consistently admitted at higher rates than their minority peers.
- o There was large variation in the proportion of foreign doctoral applicants in the nine discipline pools. Following national trends, foreigners applied most heavily to economics and mechanical/aeronautical engineering. Foreign applicants were much less likely to be admitted than their U.S. peers, though they matriculated at the same rates as their U.S. counterparts. Foreign students constituted about one-half of the matriculant pools in economics and mechanical/aeronautical engineering, but considerably less in the remaining disciplines.

Financial Support:

- o The probability of an admitted applicant's matriculating increased if financial support was offered by an institution. The move from "no support" to some significant level of support appears to be a more important matriculation determinant than increases at the margin.
- o The incidence of financial support offers varied substantially by field and institution, and there were clearly recognizable discipline and institutional patterns.

A Case Study - English:

- o A case study of English showed that the 1981-1982 applicant and matriculant pools in English were over 50 percent female, with relatively small minority and foreign representation; tested ability was higher for admits than applicants; the higher an applicant's tested ability, the greater the number of applications he or she submitted.
- o One-half of the English applicants were admitted to at least one Project department. Admission rates were simi-

lar for men and women, and were higher among domestic students than among foreign applicants. Applicants who submitted relatively high test scores enjoyed higher probabilities of admission to at least one Project institution than their peers did. Within given test ranges, the admit rates for minorities exceeded those for Caucasians.

- o English applicants who had relatively high test scores and who were admitted to relatively large numbers or programs were the ones who were most likely to receive an aid offer.
- o Admitted applicants who received an aid offer from a Project English department and those who received stipend offer were more likely than their peers to matriculate within a Project institution; applicants who were admitted to more prestigious departments (on the average) were somewhat more likely to enroll at a Project institution than applicants admitted to less prestigious departments.
- o The structure of competition (as measured by application overlap) among Project English departments was relatively fragmented with institutions operating within distinctive competitive frameworks, and with a very small core of dominant institutions. We observed two general clusters of application overlap, one cluster consisting of northeastern and western schools, the other cluster containing predominantly midwestern and southern institutions.
- o Project English departments differed substantially in the importance they assigned to test scores in the admissions process or in the granting of financial support; test scores appeared to play only a minor role in some English departments, and a large role in others.
- o English departments differed considerably in the extent to which tested ability related to matriculation.
- o English departments with the highest prestige ratings (Jones/Lindzey), greatest selectivity, and highest median GRE scores (among applicants) tended to have the largest applicant pools. Departments that extended aid offers to the highest proportion of their admitted applicants and those departments that were most likely to give grants as

the sole type of aid tended to enroll the highest percentages of the applicants they admitted. There was substantial variation across English departments, however, in the degree to which an offer of aid to a given individual was associated with the individual's matriculation in that department; thus aid appeared to be a more effective device for some departments than for others.

Progress of the 1981 Cohort to the Fall of 1984:

- o Follow-up data on selected 1981 doctoral matriculants in three disciplines -- English, economics, and chemistry -- showed that most doctoral pool students remained in the same discipline for graduate study as their undergraduate area of concentration.
- o Very few of the 1981 matriculants in English, economics and chemistry entered graduate programs in the same institutions from which they received their bachelor's degrees. Although there were variations across the disciplines, the majority of students (by a large margin) came from institutions beyond the COFHE Project set.
- o Substantial variation existed across English, economics, and chemistry in the percentage of 1981 matriculants who proceeded directly from their bachelor's level studies to Project doctoral programs; three quarters of the chemistry students moved directly from the baccalaureate into graduate study while about one-third in English did so. But there was large variation across departments within each discipline in these patterns.
- o Two years after matriculation in a doctoral program, almost 74 percent of the 1981 doctoral matriculants were still enrolled in the same program they entered originally; attrition was highest in English, and varied widely by discipline and within institutions.
- o The incidence of aid offers and the types, levels, and sources of aid varied across the disciplines and institutions. Economics students had the least amount of aid initially. They exhibited the highest increases over time, but they also maintained the most variation in levels of aid for continuing students. Chemistry had the

highest percentage of its students on aid each year. Within each discipline, there were differences across years in the types of aid extended. The sources of support across the three disciplines followed traditional funding patterns, with Teaching Assistantships becoming the dominant form of aid for third year students in English and economics, and Research Assistantships becoming the dominant form of aid in chemistry.

Some of the findings from NDS have clear public policy implications, such as reaffirmation of the need to know more about graduate education and the confirmation of the low representation of minority groups and the uneven distribution of women among the doctoral applicant pools in the arts, sciences, and engineering. At the institutional or inter-institutional level, there is a need for homogeneity in the way information is collected and stored (for any n institutions there appear to be almost n different practices with respect to recordkeeping) and a better understanding of the determinants of the choices made by applicants and by departments. While the NDS report, as a specific, narrowly-focused research document, did not devote a great deal of space to matters of policy, it is our hope that it will be used over time with other relevant research to inform the development of institutional and national policy.

Footnotes

1. Signs of Trouble and Erosion: A Report on Graduate Education in America. National Commission on Student Financial Assistance, January 1983.
2. COFHE Graduate Project Advisory Group members: Karlene Dickey, Associate Dean, Stanford University; Raymond Anderson, Associate Dean, Columbia University; Jack Frailey, Director of Student Financial Services, MIT; Clarence Ver Steeg, Dean, Northwestern University; Allen Sanderson, Assistant Provost, University of Chicago (formerly, Assistant Dean, Princeton University); Charles O'Connell, Vice President and Dean of Students, University of Chicago; Clara Sue Kidwell, Associate Dean, University of California, Berkeley; Rose Hooper, Assistant to the Dean, University of Michigan, Ann Arbor; Marion Oliver, Associate Provost, University of Pennsylvania.